

CLAIMS

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent is:

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- 1 1. A dual port SRAM cell comprising six nMOS devices,
2 two nMOS pull-down devices,
3 two nMOS first pair of transfer devices,
4 two nMOS second pair of transfer devices,
5 a first pair of bitlines coupled to the drains of the first pair of transfer
6 devices,
7 a second pair of bitlines coupled to the drains of the second pair of
8 transfer devices,
9 a first wordline coupled to the gates of the first pair of transfer devices,
10 and
11 a second wordline coupled to the gates of the second pair of transfer
12 devices.
- 1 2. The dual port SRAM cell of claim 1, wherein said first pair of
2 transfer gates also serve as the load devices for the SRAM cell.
- 1 3. The dual port SRAM cell of claim 1, wherein said second pair of
2 transfer gates also serve as the load devices for the SRAM cell.
- 1 4. The dual port SRAM cell of claim 1, wherein said first wordline is
2 the first port for read and write operations.
- 1 5. The dual port SRAM cell of claim 1, wherein said second wordline is
2 the second port for read and write operations.

1 6. A dual port SRAM cell comprising four nMOS and three pMOS
 2 devices,
 3 two nMOS pull-down devices,
 4 two pMOS pull-down^{U3} devices,
 5 ^{N3, N4} two nMOS first pair of transfer devices,
 6 one ^{P3} pMOS second transfer device,
 7 a first pair of ^{B1, B2} bitlines coupled to the drains of the first pair of transfer
 8 devices,
 9 ^{B2} a second bitline coupled to the drain of the second transfer device,
 10 ^{RW-WL} a first wordline coupled to the gates of the first pair of transfer devices,
 11 and
 12 ^{R-WL} a second wordline coupled to the gate of the pMOS second transfer
 13 device.

1 7. The dual port SRAM cell of claim 6, wherein said first wordline is
 2 the first port for read and write operations.

1 8. The dual port SRAM cell of claim 6, wherein said second wordline is
 2 the second port for read-only operations.

1 9. A high-speed SRAM architecture comprising:
 2 two dual port SRAM blocks,
 3 a TAG cache, and
 4 an interface circuit.

1 10. The high-speed SRAM architecture of claim 9, wherein a write
2 operation is performed with a first $\frac{1}{2}$ cycle writing data to the first dual port cache, and
3 a second $\frac{1}{2}$ cycle writing data to the second dual port cache via the read-write port.

1 11. The high-speed SRAM architecture of claim 9, wherein a read
2 operation is performed with a first $\frac{1}{2}$ cycle reading data from the first dual port cache,
3 and a second $\frac{1}{2}$ cycle reading data from the second dual port cache via either of the
4 dual ports.

1 12. The high-speed SRAM architecture of claim 9, wherein the
2 addresses of valid data stored in the dual dual-port SRAM cache are stored in the TAG
3 cache, incoming addresses are compared to addresses stored in the TAG and to
4 schedule read and write operations, and when new data is stored in the dual dual-port
5 cache, the status in the TAG cache is updated.